

## WEST Search History

DATE: Friday, December 10, 2004

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		<i>DB=PGPB,USPT,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ</i>	
<input type="checkbox"/>	L7	L6 and ultrasonic	7
<input type="checkbox"/>	L6	photomasks adj cleaning	61
<input type="checkbox"/>	L5	photomasks near3 cleaning	230
<input type="checkbox"/>	L4	L3 and ultrasonic	43
<input type="checkbox"/>	L3	L2 and solution	221
<input type="checkbox"/>	L2	L1 and (ammonium hydroxide)	250
<input type="checkbox"/>	L1	photomasks and cleaning	3102

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Search Results - Record(s) 1 through 7 of 7 returned.

☐ 1. Document ID: US 20030116176 A1

Using default format because multiple data bases are involved.

L7: Entry 1 of 7

File: PGPB

Jun 26, 2003

PGPUB-DOCUMENT-NUMBER: 20030116176

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030116176 A1

TITLE: Supercritical fluid processes with megasonics

PUBLICATION-DATE: June 26, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Rothman, Laura B.	South Kent	CT	US	
Robey, Raymond J.	Naperville	IL	US	
White, Rick	Nashua	NH	US	
Mount, David J.	North Andover	MA	US	
Farmer, Robert B.	Hooksett	NH	US	
Pope, Keith	Danbury	CT	US	

US-CL-CURRENT: [134/1.3](#); [134/157](#), [134/184](#), [134/26](#), [134/34](#), [134/95.1](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw D
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☐ 2. Document ID: US 20020155360 A1

L7: Entry 2 of 7

File: PGPB

Oct 24, 2002

PGPUB-DOCUMENT-NUMBER: 20020155360

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020155360 A1

TITLE: Cleaning process for photomasks

PUBLICATION-DATE: October 24, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Tange, Koji	Tokyo		JP	
Nagamura, Yoshikazu	Tokyo		JP	

Hosono, Kunihiro	Tokyo	JP
Kikuchi, Yasutaka	Tokyo	JP
Oomasa, Yuki	Tokyo	JP
Kido, Koichi	Tokyo	JP

US-CL-CURRENT: 430/5

## ABSTRACT:

A photomask provided with a light-shielding coating on a surface of a glass substrate is cleaned with O.sub.3 gas solved water to eliminate organic substances adhered on a surface of the photomask (S120). Using an alkaline chemical such as alkaline ionized water or hydrogenated water, the photomask is then cleaned to eliminate contamination (S122). After completion of these cleaning steps, the photomask is dried (S124).

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D.
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☐ 3. Document ID: US 20010013355 A1

L7: Entry 3 of 7

File: PGPB

Aug 16, 2001

PGPUB-DOCUMENT-NUMBER: 20010013355

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20010013355 A1

TITLE: Fast single-article megasonic cleaning process for single-sided or dual-sided cleaning

PUBLICATION-DATE: August 16, 2001

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Busnaina, Ahmed A.	Norwood	MA	US	

US-CL-CURRENT: 134/1.3; 134/184, 134/902

## ABSTRACT:

A fast single-article megasonic cleaning system (200) is used to clean substrates (such as semiconductor wafers, flat panel display glass, etc.) at frequencies of 400 kHz-20,000 kHz or higher. The technique provides a single-wafer cleaning process that reduces the cleaning time from the 10-20 minutes typical of the prior art to 15-60 seconds. The system utilizes concentrated megasonic energy on one wafer (90) to dramatically reduce cleaning time. The system uses a transducer (210) or a pair of transducers (210a, 210b) parallel to the substrate (90) to be cleaned where the transducer area is more than about 40% of the substrate area. Two alternate configurations are disclosed, one utilizing a horizontal wafer arrangement and the second utilizing a vertical wafer arrangement. The latter requires a smaller floor area. Preferred spacings between the wafer and the transducer, preferred transducer power and intensity, preferred overflow flow rate of fluid medium (220) (which may be deionized water), effective cleaning times, and

process temperature are disclosed.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KuBC	Draw Da
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4. Document ID: US 6277205 B1

L7: Entry 4 of 7

File: USPT

Aug 21, 2001

US-PAT-NO: 6277205

DOCUMENT-IDENTIFIER: US 6277205 B1

TITLE: Method and apparatus for cleaning photomask

DATE-ISSUED: August 21, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nagamura; Yoshikazu	Tokyo			JP
Yoshioka; Nobuyuki	Tokyo			JP
Usui; Hozumi	Saitama			JP
Yamanaka; Koji	Satama			JP

US-CL-CURRENT: 134/3; 134/1, 134/2, 134/22.19, 134/25.4, 134/26, 134/28, 134/29,  
134/34, 134/36, 134/41, 134/42, 134/902

ABSTRACT:

To provide a photomask cleaning method which brings about a high effect of removing residual sulfuric acid or foreign objects and can remove foreign objects effectively without fluctuating the transmission or other properties of the light-shielding layer (MoSiON film) in a phase shift photomask.

A method of cleaning a photomask which comprises a first step of cleaning the surface of a photomask used as a master in the photolithography step in the process for the production of semiconductor device with a hot mixture of sulfuric acid and hydrogen peroxide to decompose organic objects present thereon and remove metallic impurities, a second step of removing residual sulfuric acid from the surface of said photomask, a third step of removing foreign objects attached to the surface of said photomask, and a fourth step of drying said photomask which has finished with said first, second and third steps, characterized in that said second step involves the removal of residual sulfuric acid from the surface of said photomask with anodic water and said third step involves the removal of foreign objects with cathodic water.

11 Claims, 15 Drawing figures

Exemplary Claim Number: 10

Number of Drawing Sheets: 7

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KuBC	Draw Da
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☐ 5. Document ID: US 6071376 A

L7: Entry 5 of 7

File: USPT

Jun 6, 2000

US-PAT-NO: 6071376

DOCUMENT-IDENTIFIER: US 6071376 A

TITLE: Method and apparatus for cleaning photomask

DATE-ISSUED: June 6, 2000

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nagamura; Yoshikazu	Tokyo			JP
Yoshioka; Nobuyuki	Tokyo			JP
Usui; Hozumi	Saitama			JP
Yamanaka; Koji	Satama			JP

US-CL-CURRENT: 156/345.22; 134/1.1

## ABSTRACT:

To provide a photomask cleaning method which brings about a high effect of removing residual sulfuric acid or foreign objects and can remove foreign objects effectively without fluctuating the transmission or other properties of the light-shielding layer (MoSiON film) in a phase shift photomask.

A method of cleaning a photomask which comprises a first step of cleaning the surface of a photomask used as a master in the photolithography step in the process for the production of semiconductor device with a hot mixture of sulfuric acid and hydrogen peroxide to decompose organic objects present thereon and remove metallic impurities, a second step of removing residual sulfuric acid from the surface of said photomask, a third step of removing foreign objects attached to the surface of said photomask, and a fourth step of drying said photomask which has finished with said first, second and third steps, characterized in that said second step involves the removal of residual sulfuric acid from the surface of said photomask with anodic water and said third step involves the removal of foreign objects with cathodic water.

4 Claims, 15 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 7

Full	Title	Citation	Front	Review	Classification	Date	Reference				Claims	WORD	Draw De
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☐ 6. Document ID: JP 05134398 A

L7: Entry 6 of 7 3

File: DWPI

May 28, 1993

DERWENT-ACC-NO: 1993-209422

DERWENT-WEEK: 199326

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TITLE: Photomask cleaning device - has ultrasonic oscillator and vibration plate,

and allow water stream given to ultrasonic vibration to flow to brush NoAbstract

PRIORITY-DATA: 1991JP-0300435 (November 15, 1991)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<u>JP 05134398 A</u>	May 28, 1993		004	G03F001/08

INT-CL (IPC): B08B 1/00; B08B 3/02; B08B 3/12; B44C 1/22; G03F 1/08

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 7. Document ID: JP 57119347 A

L7: Entry 7 of 7

File: DWPI

Jul 24, 1982

DERWENT-ACC-NO: 1982-73384E

DERWENT-WEEK: 198235

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TITLE: Photomask cleaning for mfg. semiconductor device - where two methods from mechanical, chemical, ultrasonic wave, and jet press cleaning are used at same time

PRIORITY-DATA: 1981JP-0006603 (January 17, 1981)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<u>JP 57119347 A</u>	July 24, 1982		003	

INT-CL (IPC): G03F 1/00; H01L 21/30

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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Term	Documents
ULTRASONIC	243683
ULTRASONICS	10717
(6 AND ULTRASONIC).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	7
(L6 AND ULTRASONIC ).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	7

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File: DWPI

Jul 24, 1982

DERWENT-ACC-NO: 1982-73384E

DERWENT-WEEK: 198235

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TITLE: Photomask cleaning for mfg. semiconductor device - where two methods from mechanical, chemical, ultrasonic wave, and jet press cleaning are used at same time

PATENT-ASSIGNEE: MITSUBISHI ELECTRIC CORP (MITQ)

PRIORITY-DATA: 1981JP-0006603 (January 17, 1981)

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## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<input type="checkbox"/> <a href="#">JP 57119347 A</a>	July 24, 1982		003	

INT-CL (IPC): G03F 1/00; H01L 21/30

DERWENT-CLASS: L03 P84 U11

CPI-CODES: L03-D03B;

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File: DWPI

Jul 24, 1982

DERWENT-ACC-NO: 1982-73384E

DERWENT-WEEK: 198235

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TITLE: Photomask cleaning for mfg. semiconductor device - where two methods from mechanical, chemical, ultrasonic wave, and jet press cleaning are used at same time

Standard Title Terms (1):

PHOTOMASK CLEAN MANUFACTURE SEMICONDUCTOR DEVICE TWO METHOD MECHANICAL CHEMICAL  
ULTRASONIC WAVE JET PRESS CLEAN TIME

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